

1. A system for generating an image of a relief object comprising:
a single electrode electroluminescent device; and
an electrical current source, said electrical current source having one lead coupled to said single electrode of said single electrode electroluminescent device and a second lead for coupling to a relief object in proximity to said single electrode electroluminescent device so that current coupled from said current source to said relief object is strongly coupled to said single electrode electroluminescent device by ridges of said relief object and weakly coupled to said electroluminescent device by valleys of said relief object whereby more intense light is generated by areas of said electroluminescent device strongly coupled to said current from said ridges of said relief object and less intense light is generated by areas of said electroluminescent device weakly coupled to said current from valleys of said relief object to form an image of the relief object.

2. The system of Claim 1 wherein said single electrode electroluminescent device is an organic single electrode electroluminescent device.

3. The system of Claim 1 wherein said single electrode electroluminescent device is an inorganic single electrode electroluminescent device.

~~4.~~ The system of Claim 1 wherein a surface of said single electrode electroluminescent device is concave to facilitate placement of a rounded relief object against said electroluminescent device.

~~5.~~ The system of Claim 1 further comprising:
a sensor array; and
optical elements interposed between said sensor array and said single electrode electroluminescent device, said optical elements for focusing said generated light on said sensor array.

~~6.~~ The system of Claim 1 further comprising:
a one-to-one sensor array located proximate said single electrode electroluminescent device so that said generated light is sensed by said one-to-one sensor array.

~~7.~~ The system of Claim ~~4~~ wherein said sensor array is an integrated circuit.

~~8.~~ The system of Claim ~~5~~ wherein said one-to-one sensor array is amorphous silicon on glass.

~~9~~ 11 The system of Claim ~~2~~, said inorganic single electrode electroluminescent device

further comprising:

a transparent electrode layer;

a dielectric layer;

a light emitting layer containing light emitting particles, said light emitting layer being interposed between said transparent electrode and said dielectric layer so that a first surface of said transparent electrode and a first surface of said dielectric layer are proximate said light emitting layer; and

said current supply source is an alternating current source.

~~10~~ 12 13 The device of Claim ~~8~~ wherein said light emitting particles are phosphor particles.

~~11~~ 14 15 10 13 The device of Claim ~~9~~ wherein said phosphor particles are encapsulated.

~~12~~ 15 18 The device of Claim ~~8~~ wherein said light emitting layer is a phosphor coating along said first surface of said transparent electrode layer.

~~Claim 3~~
13. The device of Claim 8 wherein said light emitting layer and said dielectric layer are a composite material in which said light emitting particles are dispersed through said dielectric layer.

~~Claim 14~~
14. The device of Claim 12 wherein said light emitting particles are phosphor particles.

~~Claim 15~~
15. The device of Claim 8 wherein said transparent electrode layer is one of indium tin oxide and zinc oxide:aluminum.

~~Claim 16~~
16. The device of Claim 8 wherein said alternating source is adjustable in voltage amplitude.

17. The device of Claim 8 further comprising a variable resistive layer being proximate to said dielectric layer, said variable resistive layer being comprised of conductive particles dispersed through a non-conductive medium;

a flexible electrode substantially covering a surface of said variable resistive layer;

and

said second lead of said alternating current source being coupled to said flexible electrode so that a localized pressure gradient generated by a portion of a relief object contacting said flexible electrode forms a conductive path through said variable resistive layer which corresponds to said localized pressure gradient whereby said current flows from said flexible electrode through said variable resistive layer, dielectric layer and light emitting particles to said transparent electrode in correspondence with said localized pressure gradient to generate a light image of said relief object.

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18. The device of Claim 8, said organic single electrode electroluminescent device further comprising:

a thin, sublimed molecular film deposited on a transparent anode.

19. The device of Claim 17, said thin, sublimed molecular film being tris(8-quinolinolato) aluminum (III).

~~16~~ 2 The device of Claim ~~8~~, said organic single electrode electroluminescent device further comprising:

a light-emitting polymer deposited on a transparent anode.

~~21~~ 21 The device of Claim ~~19~~, said light-emitting polymer being one of the group of poly(p-phenylene vinylene), soluble polythiophene derivatives, or polyanilene.

~~22~~ 22 The device of Claim ~~18~~, said transparent anode ~~light-~~ being comprised of a transparent base substrate coated with indium tin oxide.

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34* 23. The device of Claim 1 further comprising:

a variable resistive layer being proximate to said organic single electrode electroluminescent device, said variable resistive layer being comprised of conductive particles dispersed through a non-conductive medium;

a flexible electrode substantially covering a surface of said variable resistive layer;

and

a direct current source having one lead coupled to said single electrode of said organic single electrode device and a second lead exposed at a surface of said flexible electrode so that a localized pressure gradient generated by a portion of a relief object contacting said flexible electrode forms a conductive path through said variable resistive layer which corresponds to said localized pressure gradient whereby said current flows from said direct current source and flexible electrode through said variable resistive layer to said single electrode of said organic single electrode electroluminescent device in correspondence with said localized pressure gradient to generate a light image of said relief object.

24 | 24 A system for generating an image of a relief object comprising:

 a single electrode electroluminescent device;

 a variable resistive layer being proximate to one surface of said single electrode electroluminescent device, said variable resistive layer being comprised of conductive particles dispersed through a non-conductive medium;

 a flexible electrode substantially covering a surface of said variable resistive layer;

 an electrical current source, said electrical current source having one lead coupled to said single electrode of said single electrode electroluminescent device and a second lead for coupling to a relief object contacting said flexible electrode so that current coupled from said current source to said flexible electrode is strongly coupled through a low resistance path through said variable resistive layer to said single electrode electroluminescent device by ridges of said relief object and weakly coupled through a high resistance path through said variable resistive layer to said electroluminescent device by valleys of said relief object whereby more intense light is generated by areas of said electroluminescent device strongly coupled to said current from said ridges of said relief object and less intense light is generated by areas of said electroluminescent device weakly coupled to said current from valleys of said relief object to form an image of the relief object.

25. The system of Claim 24 wherein said single electrode electroluminescent device is an organic single electrode electroluminescent device.

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26. The system of Claim 23 wherein said single electrode electroluminescent device
is an inorganic single electrode electroluminescent device.

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27. The system of Claim 23 further comprising:

a sensor array; and

optical elements interposed between said sensor array and said single electrode
electroluminescent device, said optical elements for focusing said generated light on said sensor
array.

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28. The system of Claim 23 further comprising:

a one-to-one sensor array located proximate said single electrode
electroluminescent device so that said generated light is sensed by said one-to-one sensor array.

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29. The system of Claim 26 wherein said sensor array is an integrated circuit.

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30. The system of Claim 27 wherein said one-to-one sensor array is amorphous
silicon on glass.

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The system of Claim ~~25~~, said inorganic ~~single electrode~~ electroluminescent device further comprising:

a transparent electrode layer;

a dielectric layer;

a light emitting layer containing light emitting particles, said light emitting layer being interposed between said transparent electrode and said dielectric layer so that a first surface of said transparent electrode and a first surface of said dielectric layer are proximate said light emitting layer; and

said current supply source is an alternating current source.

26 269 32. The device of Claim ~~24~~, said organic single electrode electroluminescent device further comprising:

a thin, sublimed molecular film deposited on a transparent anode.

33 28 33. The device of Claim ~~31~~, said thin, sublimed molecular film being tris(8-quinolinolato) aluminum (III)

34. The device of Claim 24, said organic single electrode electroluminescent device further comprising:

a light-emitting polymer deposited on a transparent anode.

§ 35 The device of Claim 33, said light-emitting polymer being one of the group of poly(p-phenylene vinylene), soluble polythiophene derivatives, or polyanilene.

~~36~~ The devices of Claims 31 or 33, said transparent anode being comprised of a transparent base substrate coated with indium tin oxide.

37. The device of Claim 31 or 33, said current source being a direct current source having one lead coupled to said single electrode of said organic single electrode device and a second lead exposed at a surface of said flexible electrode so that a localized pressure gradient generated by a portion of a relief object contacting said flexible electrode forms a conductive path through said variable resistive layer which corresponds to said localized pressure gradient whereby said current flows from said direct current source and flexible electrode through said variable resistive layer to said single electrode of said organic single electrode electroluminescent device in correspondence with said localized pressure gradient to generate a light image of said relief object.

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~~35~~ A method for imaging a relief object comprising the steps of:

coupling a single electrode of a single electrode electroluminescent device to a current source;

contacting a relief object to an exposed surface of said single electrode electroluminescent device; and

coupling said current source to said relief object so that current flows from said relief object to said electroluminescent device to generate an optical image of said relief object.

~~36~~ The method of claim ~~38~~ further comprising the steps of:

forming said single electrode electroluminescent device with a concave surface to facilitate contacting rounded relief objects to said electroluminescent device.

~~40~~ ~~39~~ The method of claim ~~38~~ further comprising the steps of:

placing optical elements to focus said image generated by said single electrode electroluminescent device; and

locating a sensor array to receive said focused image from said optical elements.

~~41-40~~ 31 The method of claim 38 further comprising the steps of:

locating a one-to-one sensor array proximate said single electrode electroluminescent device to receive said image generated by said single electrode electroluminescent device.

~~42. 39~~ 42. The method of claim 38 wherein said current source is an alternating current source and said single electrode electroluminescent device is an inorganic single electrode electroluminescent device.

~~43. 39~~ 43. The method of claim 38 wherein said current source is a direct current source and said single electrode electroluminescent device is an organic single electrode electroluminescent device.

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44. The method of claim 38 further comprising the steps of:

locating a variable resistive layer adjacent said exposed surface of said single electrode electroluminescent device with a variable resistive layer;

substantially covering said variable resistive layer with a flexible electrode; and

coupling said current source to said flexible electrode rather than said relief object so that said contacting step contacts said relief object with said flexible electrode so that pressure from ridges and valleys of said relief object generate relatively low and high resistance conductive paths through said variable resistive layer whereby said current from said current source is provided through said variable resistive layer at different magnitudes corresponding to said ridges and valleys of said relief object and said different currents cause said single electrode electroluminescent device to generate said image of said relief object.

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